

What is claimed is:

- 1 1. A wireless communication method, comprising:
 - 2 receiving a center modulated signal on a wireless channel n, a lower adjacent
 - 3 modulated signal on a lower adjacent licensed channel n-1, and a higher adjacent
 - 4 modulated signal on a higher adjacent licensed channel n+1;
 - 5 simultaneously processing the center modulated signal into a baseband
 - 6 signal and characterizing the lower and higher adjacent modulated signals; and
 - 7 sending a control signal to a transmitter of the center modulated signal based
 - 8 on a characterization of the lower and higher adjacent modulated signals.
- 1 2. The method of claim 1, wherein receiving a center modulated signal on a wireless channel n, a lower adjacent modulated signal on a lower adjacent licensed channel n-1, and a higher adjacent modulated signal on a higher adjacent licensed channel n+1 includes filtering a representative signal of a received signal through a three channel filter to provide representative signals of the center modulated signal and the lower and higher adjacent modulated signals.
- 1 3. The method of claim 1, simultaneously processing the center modulated signal into a baseband signal and characterizing the lower and higher adjacent modulated signals includes:
 - 4 conditioning the center modulated signal and the lower and higher adjacent modulated signals into a filtered signal; and
 - 6 processing the filtered signal into a processed signal using a three channel bandpass filter and frequency converter to provide the processed signal with a known first frequency to carry a representative signal for the lower adjacent modulated signal, a known second frequency to carry a representative signal for the center modulated signal, and a known third frequency to carry a representative signal for the higher adjacent modulated signal.

1 4. The method of claim 3, wherein simultaneously processing the center
2 modulated signal into a baseband signal and characterizing the lower and higher
3 adjacent modulated signals further includes:

4 independently filtering the processed signal using a switched filter to
5 suppress the known lower and higher adjacent modulated signals;
6 converting the processed signal from an analog signal into a digital signal;
7 demodulating the digital signal to provide the baseband signal; and
8 characterizing the lower and higher adjacent modulated signals.

1 5. The method of claim 1, wherein sending a control signal to a transmitter of
2 the desired signal based on a characterization of the lower and higher adjacent
3 modulated signals includes sending a control signal to the transmitter to change a
4 transmission frequency to another available channel.

1 6. The method of claim 1, wherein sending a control signal to a transmitter of
2 the desired signal based on a characterization of the lower and higher adjacent
3 modulated signals includes sending a control signal to the transmitter to modify a
4 power level for a transmission of the desired signal.

1 7. A receiver, comprising:
2 means to receive a wireless signal having modulated frequencies
3 corresponding to at least a wireless channel n and two adjacent licensed channels n-
4 1 and n+1;
5 means to process the wireless signal to simultaneously provide a baseband
6 signal corresponding to the wireless channel n and characterize signals
7 corresponding to the two adjacent channels n-1 and n+1; and
8 means to send a control signal to a transmitter adapted to transmit a signal
9 over wireless channel n based on a characterization of the signals corresponding to
10 the two adjacent channels n-1 and n+1.

1 8. The receiver of claim 7, wherein the means to process the wireless signal to
2 simultaneously provide a baseband signal corresponding to the wireless channel n
3 and characterize signals corresponding to the two adjacent channels n-1 and n+1
4 includes:

5 means to filter a signal representative of the wireless signal into a signal
6 having first, second and third frequencies corresponding to channels n-1, n and n+1;
7 and

8 means to demodulate a signal corresponding to the second frequency and to
9 characterize signals corresponding to the first and third frequencies.

1 9. The receiver of claim 8, further comprising means to independently adjust
2 signal levels on the first and third frequencies.

1 10. The receiver of claim 7, wherein the means to process the wireless signal to
2 simultaneously provide a baseband signal corresponding to the wireless channel n
3 and characterize signals corresponding to the two adjacent channels n-1 and n+1
4 includes:

5 means to up-convert a first signal representative of the wireless signal into
6 an up-converted second signal such that a frequency corresponding to channel N is
7 increased to a known up-converted center frequency and frequencies corresponding
8 to the adjacent channels N-1 and N+1 are increased to up-converted adjacent
9 frequencies;

10 means to filter the up-converted second signal to pass the up-converted
11 center frequency and the up-converted adjacent frequencies as a filtered up-
12 converted third signal;

13 means to down-convert the third signal to a down-converted fourth signal
14 that includes a known down-converted center frequency corresponding to the
15 channel n and known down-converted adjacent frequencies corresponding to
16 channels n-1 and n+1;

17 means to independently filter and balance the known down-converted
18 adjacent frequencies to reduce dynamic range; and
19 means to demodulate the down-converted center frequency into the
20 baseband frequency and characterize the balanced adjacent channel frequency
21 components.

1 11. A receiver, comprising:
2 a signal processing module to filter and frequency convert a signal
3 representative of a radio frequency (RF) signal to provide a processed signal having
4 predetermined first, second and third frequencies, the predetermined second known
5 frequency corresponding to a center channel n of the RF signal, and the
6 predetermined first and third frequencies corresponding to adjacent licensed RF
7 channels n-1 and n+1;
8 an adjacent carrier filter module to independently filter the predetermined
9 first and third frequencies of the processed signal and to provide a balanced signal
10 representative of channels n-1, n and n+1;
11 an analog-to-digital converting module to convert the balanced signal from
12 an analog signal to a digital signal; and
13 a processor to receive the digital signal, provide a baseband signal for the RF
14 channel n and characterize the adjacent RF channels n-1 and n+1.

1 12. The receiver of claim 11, wherein the processor is adapted to provide a
2 transmitter control signal to be transmitted to a transmitter adapted to transmit
3 signals on channel n.

1 13. The receiver of claim 12, wherein the transmitter control signal includes a
2 signal for the transmitter to adjust a power level for a transmission on channel n.

1 14. The receiver of claim 12, wherein the transmitter control signal includes a
2 signal for the transmitter to transmit on another channel.

1 15. The receiver of claim 11, wherein the signal processing module includes:
2 an up-converter to convert the processed signal into an up-converted signal
3 with increased frequencies such that the center channel n and the adjacent channels
4 n-1 and n+1 in the up-converted signal have known up-converted frequencies;
5 a bandpass filter to filter the up-converted signal and pass a filtered signal
6 with known up-converted frequencies corresponding to the center channel n and the
7 adjacent channels n-1 and n+1; and
8 a down-converter to convert the filtered signal into a down-converted signal
9 with decreased frequencies such that the center channel n and the adjacent channels
10 n-1 and n+1 in the down-converted signal have known down-converted frequencies.

1 16. The receiver of claim 11, further comprising a signal conditioning module
2 including at least one bandpass filter module.

1 17. The receiver of claim 16, wherein the at least one bandpass filter module is
2 adapted to pass frequencies within a UHF frequency range.

1 18. The receiver of claim 11, further comprising a signal conditioning module
2 including a power calibration module to adjust an amplitude of the signal
3 representative of a radio frequency (RF) signal based on a power level of the RF
4 signal.

1 19. The receiver of claim 11, further comprising a signal conditioning module
2 adapted to pass the conditioned signal with a frequencies between approximately
3 450 MHz and approximately 700 MHz, wherein the signal processing module
4 includes:

5 an up-converter to synthesize the conditioned signal with a up-conversion
6 mixing signal having a frequency within a range of approximately 200 MHz to 500
7 MHz, the frequency of the up-conversion mixing signal being selectable in 6 MHz

8 steps based on the frequency of channel n such that channel N in a resulting up-
9 converted signal has a center frequency of approximately 915 MHz;
10 a surface acoustic wave (SAW) filter to filter the up-converted signal and
11 pass frequencies within a range of approximately 906 MHz to 924 MHz as a filtered
12 up-converted signal, wherein channel n is represented at a center frequency of
13 approximately 915 MHz in the filtered up-converted signal, channel n-1 is
14 represented at a center frequency of approximately 909 MHz in the filtered up-
15 converted signal; and channel n+1 is represented at a center frequency of
16 approximately 921 MHz in the filtered up-converted signal; and
17 a down-converter to mix the filtered up-converted signal with a down-
18 conversion mixing signal have a frequency of approximately 900 MHz to provide a
19 down-converted signal within a range of approximately 6 MHz to 24 MHz, wherein
20 channel n is represented at a center frequency of approximately 15 MHz in the
21 down-converted signal, channel n-1 is represented at a center frequency of
22 approximately 9 MHz in the down-converted signal, and channel n+1 is represented
23 at a center frequency of approximately 21 MHz in the down-converted signal.

1 20. The receiver of claim 19, wherein:
2 the down-converter includes an image reject mixer to provide an in-phase
3 signal (I) and a quadrature-phase signal (Q); and
4 the adjacent carrier filter module to independently filter and suppress the
5 9MHz and 21 MHz channels for both the I and Q signal.

1 21. The receiver of claim 20, wherein the analog-to-digital (A-D) converting
2 module includes a first 12-bit A-D converter to convert the I signal from an analog
3 signal to a digital signal, and a second 12-bit A-D converter to convert the Q signal
4 from an analog signal to a digital signal.

1 22. A wireless communication system, comprising:
2 a substantially omni-directional antenna; and

3 a receiver connected to the antenna to receive a desired signal over a radio
4 frequency (RF) channel n and signals over adjacent licensed RF channels n-1 and
5 n+1, to process the desired signal and signals over adjacent wireless channels to
6 provide a demodulated signal corresponding to the RF channel n and a
7 characterization of the signals over the RF adjacent channels n-1 and n+1 in real
8 time, and to send a control signal to a transmitter of the desired signal, the control
9 signal being based on the characterization of the signals over the RF adjacent
10 channels n-1 and n+1.

1 23. The system of claim 22, wherein the RF channels n-1, n, and n+1 are within
2 a UHF frequency range.

1 24. The system of claim 22, wherein the control signal includes a signal for the
2 transmitter to adjust a power level for transmission of the desired signal over the RF
3 channel n.

1 25. The system of claim 22, wherein the control signal includes a signal for the
2 transmitter to change a frequency for transmission of the desired signal.

1 26. The system of claim 22, wherein the receiver includes:
2 a signal processing module to filter and frequency convert a signal
3 representative of an RF signal to provide a processed signal having known first,
4 second and third frequencies, the second known frequency of the processed signal
5 corresponding to the RF channel n, and the first and third known frequencies of the
6 processed signal corresponding to the RF adjacent channels n-1 and n+1; and
7 an adjacent carrier filter module to independently filter the first and third
8 known frequencies of the processed signal and to provide a suppressed signal
9 representative of the RF channels n-1, n and n+1.